Curriculum Vitae of Kishwar Ahmed

Contact Information

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Research Interests

My research interests span high-performance computing and cloud computing. More specifically, my research interests include modeling and simulation, energy-efficiency, and parallel computing.

Teaching Interests

Parallel Computing, Modeling and Simulation, Computer Architecture and Design, Data Structure and Algorithms, Programming Languages.

Education

Ph.D. in Computer Science **April 2018**
Florida International University, Miami, FL, USA
Thesis: Energy Demand Response for High-Performance Computing Systems
Supervisor: Prof. Jason Liu

M. Sc. in Computer Science **April 2017**
Florida International University (FIU), Miami, FL, USA
CGPA: 3.77/4.00

B. Sc. in Computer Science and Engineering **October 2009**
Bangladesh University of Engineering & Technology (BUET), Dhaka, Bangladesh
CGPA: 3.67/4.00
Rank: 13^{th} in a class of 125
Thesis: Techniques for Finding Network Building Blocks in Biological Networks
Supervisor: Prof. Saidur Rahman, Dept of CSE, BUET

Work Experience

Assistant Professor **August 2019 - present**
University of South Carolina Beaufort, Bluffton, SC, USA

- Teach undergraduate and graduate courses in Computer Science, establish a productive program of scholarly research, publish scholary articles, advise students, and provide service to the department, university, and community.

Lecturer **June 2018 - May 2019**
Florida International University, Miami, FL, USA

- Teach undergraduate and graduate courses in Computer Science (such as Data Communications, and Net-Centric Computing), publish scholarly research articles in conference venue in the area of Computer Science

Graduate Research Assistant **August 2017 - April 2018**
Florida International University, Miami, FL, USA

- Assist with teaching courses in Computer Science. Assist with research on modeling and simulation, performance prediction, and energy-efficiency. Prepare research reports and contribute to manuscripts for publication.

Research Aide **May 2017 - July 2017**
Argonne National Laboratory, Lemont, IL, USA

- Assist with research on high-performance computing, and energy-efficiency. Prepare research reports and contribute to manuscripts for publication.

Graduate Teaching Assistant **August 2012 - April 2017**
Florida International University, Miami, FL, USA

- Assist with teaching courses in Computer Science (such as Programming I Lab, Programming II, Introduction to Microcomputers Lab, Computer Data Analysis Lab, and Operating Systems). Assist with research on modeling and simulation, performance prediction, and energy-efficiency. Prepare research reports and contribute to manuscripts for publication.

Lecturer **May 2010 - August 2012**
University of Information Technology & Sciences, Dhaka, Bangladesh

- Teach undergraduate courses in Computer Science (such as Database Management Systems, Algorithms, Structured Programming Language, Computer Programming, and Computer Fundamentals and Web Technology).

Software Engineer **December 2009 - May 2010**
aamra solutions limited, Dhaka, Bangladesh

- Develop software solutions, collaborate with industry partners for software implementations.

Awards and Honors

Travel Grant, NSF MERIT Workshop	**2019**
NSF Travel Grant, NSF NeTS Early-Career Investigators Workshop	**2019**
NSF Travel Grant, NSF CSR Aspiring Investigators Workshop	**2019**
Faculty Travel Grant, NSF MERIF Education Workshop	**2019**
Outstanding Graduate Student, FIU SCIS	**2018**
Student Volunteer, IEEE/ACM Supercomputing Conference (SC)	**2017**
Student Travel Grant, IEEE/ACM Supercomputing Conference (SC)	**2017**
Student Travel Grant, ACM SIGSIM Winter Simulation Conference (WSC)	**2017**
The University of Chicago Travel Grant, Chameleon User Meeting	**2017**
Top proposal abstract, Chameleon User Meeting	**2017**
NCAR Travel Grant, Software Engineering Assembly Conference	**2016**
Dean's Merit List Award, BUET	**2008**

Funded Research

Power Capping Allocation for Energy-Efficient High Performance Computing. Advanced Support for Innovative Research Excellence (ASPIRE) at University of South Carolina. PI: Kishwar Ahmed. $15K. 2020-2022.

Publications

Book Chapter

1. **Kishwar Ahmed**, Shaolei Ren, Yuxiong He, and Athanasios V. Vasilakos, "Online Resource Management for Carbon-Neutral Cloud Computing," Handbook of Data Centers, Edited by Samee U. Khan and Albert Y. Zomaya, March 2015.

Refereed Journal Paper

2. Mohammad A. Islam, **Kishwar Ahmed**, Hong Xu, Nguyen H. Tran, Gang Quan, Shaolei Ren, "Exploiting Spatio-Temporal Diversity for Water Saving in Geo-Distributed Data Centers," IEEE Transactions on Cloud Computing, February 2016. (**Impact factor: 7.93**)

Refereed Conference Papers

3. Samia Tasnim, Ahmon Ferguson, Brooke Gordon, Chad Gordon, **Kishwar Ahmed**, and Idongesit Mkpong-Ruffin, "A Smart Environment Monitoring Application for Mobile Internet of Things," in Proceedings of the 27^{th} International Conference on Systems Engineering (**ICSEng 2020**), Las Vegas, NV, December 2020.

4. **Kishwar Ahmed**, Samia Tasnim, and Kazutomo Yoshii, "Simulation of Auction Mechanism Model for Energy-Efficient High Performance Computing," in Proceedings of the 2020 ACM SIGSIM Conference on Principles of Advanced Discrete Simulation (**SIGSIM-PADS 2020**), Miami, FL, June 2020.

5. **Kishwar Ahmed**, Kazutomo Yoshii, and Samia Tasnim, "Thermal-Aware Power Capping Allocation Model for High Performance Computing Systems," 6^{th} International Conference on Computational Science & Computational Intelligence (**CSCI 2019**), Las Vegas, NV, December 2019. To appear. (**Acceptance rate: 17%**)

6. **Kishwar Ahmed**, and Jason Liu, "Simulation of Energy-Efficient Demand Response for High Performance Computing System," in Proceedings of the 2019 Winter Simulation Conference (**WSC 2019**), National Harbor, MD, December 2019. To appear.

7. **Kishwar Ahmed**, Jesse Bull, and Jason Liu, "Contract-Based Demand Response Model for High Performance Computing Systems," in Proceedings of the 16^{th} IEEE International Conference on Parallel and Distributed Processing with Applications (**ISPA 2018**), Melbourne, Australia, December 2018.

8. **Kishwar Ahmed**, Jason Liu, and Kazutomo Yoshii, "Enabling Demand Response for HPC Systems Through Power Capping and Node Scaling," in Proceedings of the 20^{th} IEEE International Conference on High Performance Computing and Communications (**HPCC 2018**), Exeter, UK, June 2018.

9. **Kishwar Ahmed**, Jason Liu, Abdel-Hameed Badawy, and Stephan Eidenbenz, "A Brief History of HPC Simulation and Future Challenges," in Proceedings of the 2017 Winter Simulation Conference (**WSC 2017**), Las Vegas, NV, December 2017.

10. **Kishwar Ahmed**, Jason Liu, and Xingfu Wu, "An Energy Efficient Demand-Response Model for High Performance Computing Systems," in Proceedings of the 25^{th} IEEE International Symposium on the Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (**MASCOTS 2017**), Banff, AB, Canada, September 2017. (**Acceptance rate: 23.8%**)

11. **Kishwar Ahmed**, Jason Liu, Stephan Eidenbenz, and Joe Zerr, "Scalable Interconnection Network Models for Rapid Performance Prediction of HPC Applications," in Proceedings of the 18^{th} IEEE International Conference on High Performance Computing and Communications (**HPCC 2016**), Sydney, Australia, December 2016.

12. **Kishwar Ahmed**, Mohammad Obaida, Jason Liu, Stephan Eidenbenz, Nandakishore Santhi, and Guillaume Chapuis, "An Integrated Interconnection Network Model for Large-Scale Performance Prediction," in Proceedings of the 2016 ACM SIGSIM Conference on Principles of Advanced Discrete Simulation (**SIGSIM-PADS 2016**), Banff, AB, Canada, May 2016.

13. **Kishwar Ahmed**, Mohammad A. Islam, and Shaolei Ren, "A Contract Design Approach for Colocation Data Center Demand Response," In Proceedings of the 34^{th} IEEE/ACM International Conference on Computer-Aided Design (**ICCAD 2015**), Austin, TX, November 2015. (**Acceptance rate: 24.6%**)

14. Mohammad A. Islam, **Kishwar Ahmed**, Shaolei Ren, and Gang Quan, "Exploiting Temporal Diversity of Water Efficiency to Make Data Center Less "Thirsty"," In Proceedings of the 11^{th} USENIX International Conference on Autonomic Computing (**ICAC 2014**), Philadelphia, PA, June 2014. (**Acceptance rate: 20.3%**)

15. Samia Tasnim, Mohammad Ataur Rahman Chowdhury, **Kishwar Ahmed**, Niki Pissinou, and S. S. Iyengar, "Location Aware Code Offloading on Mobile Cloud with QoS Constraint," In Proceedings of the 11^{th} Annual IEEE Consumer Communications & Networking Conference (**CCNC 2014**), Las Vegas, NV, January 2014.

16. **Kishwar Ahmed**, Shaolei Ren, Vance Turnewitsch, and Athanasios V. Vasilakos, "Online Credibility Optimization and Power Control for Secure Mobile Crowdsourcing," In Proceedings of the 51^{st} Annual Allerton Conference on Communications, Control and Computing (**Allerton 2013**), Monticello, IL, October 2013.

Workshop Papers and Posters

17. **Kishwar Ahmed**, and Jason Liu, "Energy Demand Response Modeling for High Performance Computing Systems," Workshop on Modeling & Simulation of Systems and Applications (**ModSim 2018**), Seattle, WA, August 2018.

18. Samia Tasnim, **Kishwar Ahmed**, Niki Pissinou, and S. S. Iyengar, "Offloading Code Efficiently on Mobile Cloud," Poster in Grace Hopper Celebration of Women in Computing (**GHC 2015**), Houston, TX, October 2015.

19. **Kishwar Ahmed**, Mohammad A. Islam, Shaolei Ren, and Gang Quan, "Can Data Center Become Water Self-Sufficient?," in 6^{th} Usenix Workshop on Power-Aware Computing and Systems (**HotPower 2014**) held with **USENIX OSDI 2014**, Broomfield, CO, October 2014. (**Acceptance rate: 34%**)

Thesis

20. **Kishwar Ahmed**, "Energy Demand Response for High-Performance Computing Systems," Ph.D. Thesis, Floirda International University, April 2018. Advisor: Jason Liu.

Working/Submitted Papers

21. Samia Tasnim, Niki Pissinou, S. S. Iyengar, Kianoosh G. Boroojeni, and **Kishwar Ahmed**, "RCoD: Reputation-based Context-aware Data Fusion in mobile crowdsensing for the Internet of things (IoT)," Submitted to ACM Transaction on Sensor Networks, 2019.

Talks and Presentations

1. *Simulation of Auction Mechanism Model for Energy-Efficient High Performance Computing*, presented at ACM SIGSIM Conference on Principles of Advanced Discrete Simulation (SIGSIM-PADS), Miami, FL, June 2020.
2. *Simulation of Energy-Efficient Demand Response for High Performance Computing Systems*, presented at Winter Simulation Conference (WSC 2019), National Harbor, MD, December 2019.
3. *Thermal-Aware Power Capping Allocation Model for High Performance Computing Systems*, presented at 6^{th} International Conference on Computational Science & Computational Intelligence (CSCI 2019), Las Vegas, NV, December 2019.
4. *Modeling and Simulation of Computer and Network Systems*, presented at NeTS Early Career Workshop 2019, National Science Foundation, Alexandria, VA, August 5-6, 2019.
5. *Interconnection Network Models for Rapid Performance Prediction of HPC Applications*, presented at Argonne Leadership Computing Facility Seminar, Argonne National Laboratory, Lemont, IL, July 9, 2019.
6. *Energy Demand Response Modeling for High Performance Computing Systems*, presented at Workshop on Modeling & Simulation of Systems and Applications (ModSim 2018), Seattle, WA, August 14-17, 2018.
7. *Interconnection Network Models for Large-Scale Performance Prediction*, presented at 4^{th} Summer of CODES workshop, Argonne National Laboratory, Lemont, IL, July 17-18, 2018.
8. *A Brief History of HPC Simulation and Future Challenges.* Conference talk at Winter Simulation Conference (WSC 2017), Las Vegas, NV, December 3-6, 2017.
9. *How to Enable HPC System Demand Response: An Experimental Study*, presented at Chameleon User Meeting 2017, Argonne National Laboratory, Lemont, IL, September 13-14, 2017.
10. *A Power Capping Approach for HPC System Demand Response*, presented at CS Seminar, Argonne National Laboratory, Lemont, IL, July 27, 2017.
11. *Enabling Demand Response Participation for HPC Systems*, presented at 3^{rd} Summer of CODES workshop, Argonne National Laboratory, Lemont, IL, July 11-12, 2017.
12. *Performance Prediction Models for Large-Scale Interconnection Networks in HPC System*, presented at Graduate Student Appreciation Week (GSAW) scholarly forum 2017, Florida International University, Miami, FL, March 27-28, 2017.
13. *Contract-Based Emergency Demand Response Participation of Multi-tenant Colocation Data Center*, presented at Graduate Student Appreciation Week (GSAW) scholarly forum 2016, Florida International University, Miami, FL, March 28-29, 2016.
14. *A Contract Design Approach for Colocation Data Center Demand Response*, presented at IEEE/ACM International Conference on Computer-Aided Design (ICCAD 2015), Austin, TX, USA, November 2-6, 2015.

Professional Activities

- **Proceedings chair**
  - ACM SIGSIM Conference on Principles of Advanced Discrete Simulation (**ACM SIGSIM PADS 2020**)
- **Session Chair**
  - International Conference on Computational Science & Computational Intelligence (**CSCI 2019**)
- **Program committee member**
  - Winter Simulation Conference (**WSC 2019**)

- ACM SIGSIM Conference on Principles of Advanced Discrete Simulation (**ACM SIGSIM PADS 2019, 2020**)
- International Conference on Computing, Networking and Communications (**ICNC 2016, 2017, 2018, 2019, 2020**)
- International Workshop on Applied Modeling and Simulation (**WAMS 2019**)
- IEEE International Conference on Communications (**ICC 2018**)

- **Journal reviewer**
  - ACM Transactions on Modeling and Performance Evaluation of Computing Systems (**ToMPECS**)
  - Elsevier **SoftwareX**
  - ACM Transactions on Modeling and Computer Simulation (**TOMACS**)
  - IEEE Transactions on Big Data (**TBD**)
  - IEEE Transactions on Cloud Computing (**TCC**)
  - IEICE Transactions on Information and Systems (**ISS**)
- **Reviewer**
  - Georgia Undergraduate Research Conference (**GURC 2019**)
  - IEEE International Conference on Cloud Computing (**Cloud 2015**)
- **Sub-reviewer**
  - ACM SIGSIM Conference on Principles of Advanced Discrete Simulation (**ACM SIGSIM PADS 2016**)
  - IEEE International Symposium on the Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (**IEEE MASCOTS 2019**)

Skills

Programming Languages: Python, C/C++, Java, PL/SQL, HTML, JavaScript, Shell
Programming Environments: Vim, Matlab, NetBeans, Eclipse, Microsoft Visual Studio, Oracle, MySQL
Other Tools/ Softwares: MPI, OpenMP, Git, SVN, LaTeX, PacketTracer, Network Simulator-2
Operating Systems: Linux, Microsoft Windows family, Apple OS X

Selected Software Projects

Demand-response models for HPC systems **January 2017 - April 2018**

- Proposed and developed algorithms for HPC systems' participation in demand response and reduce energy consumption.
- Published at premier conference venues, such as IEEE MASCOTS, IEEE HPCC, etc.

Job scheduler simulator **January 2017 - April 2018**

- Developed a simulator for HPC jobs' scheduling and resource allocation, to demonstrate effectiveness of proposed HPC system's demand response participation.

Performance prediction toolkit (PPT) **August 2015 - December 2016**

- Developed the interconnection network models for accurate, scalable, and efficient performance prediction of large-scale scientific applications in high-performance computing architectures (`https://github.com/lanl/PPT`).
- Published at premier conference venues, such as ACM SIGSIM PADS, IEEE HPCC, etc.

Sustainable computing for cyber-physical systems **May 2013 - July 2015**

- Developed novel algorithms to enable sustainable computing through reduction of energy consumption, carbon emission, etc. for cyber-physical systems.
- Published at top conference and journal venues, such as IEEE/ACM ICCAD, USENIX ICAC, IEEE Transactions of Cloud Computing, etc.

Java program instrumentation **August 2014 - November 2014**

- A dynamic analyzer to detect concurrency bugs of multi-threaded programs. Apache Commons Byte Code Engineering Library (BCEL) was used to detect bugs by looking at the footprints of execution.

Hot topics detection in Twitter **January 2014 - April 2014**

- A project for finding hot topics and related active users in Twitter. Used MySQL to store the Tweets and the authors, identified trending topics in Twitter, and produced the topics and related authors on map using Apache Tomcat, JavaServer Pages, Highcharts.

Collaboration and Supervision Skills

- Collaborated with group of skilled research scientists and software developers from Los Alamos National Laboratory, NM and Argonne National Laboratory, Lemont, IL.
- Supervised an REU (Research Experience for Undergraduate) student during Summer 2013, which resulted in an article being published at an IEEE conference.